

## CLAIM AMENDMENTS

The claims are amended as follows.

1. (Original) A communication system, comprising:
  - a central station that receives an optical data signal and applies a composite code to the optical signal, the composite code including a first code and a second code, so as to produce a composite-coded optical signal;
  - a first-level mux station that receives the composite-coded optical signal and decodes the first code from at least a portion of the optical signal, producing a first-level decoded optical signal;
  - a second-level mux station that receives the first-level decoded optical signal and decodes the second code from at least a portion of the optical signal, thereby producing a fully decoded optical signal; and
  - a user station that receives the fully decoded optical signal.
2. (Original) The communication system of claim 1, wherein the first-level mux station includes a reconfigurable encoder for applying a selected composite code.
3. (Original) The communication system of claim 1, wherein the central station applies a composite code selected from a set of composite codes.
4. (Original) The communication system of claim 3, wherein composite codes are generated from a set of first-level codes and a set of second-level codes.
5. (Previously Amended) A central station for an optical network, comprising:
  - a transmitter coupled to produce an optical data signal from an electrical data signal; and
  - an encoder coupled to apply a composite code to the optical data signal, the composite code having a first code and a second code, wherein the first code is to identify a first station and the second code is to identify a second station that is coupled to receive a decoded output signal from the first station.

6. (Previously Amended) The central station of claim 5, wherein the composite code to be applied by the encoder is a temporal code.

7. (Previously Amended) The central station of claim 6, wherein the composite code is an address code designate an intended destination for data defined by the electrical data signal.

8. (Currently Amended) A multiplexing station for an optical network, comprising:  
a temporal address decoder coupled to receive a signal containing data coded according to a first downstream address code and a second downstream address code and to strip the first downstream address code from the signal, wherein the first downstream address code is to designate a first destination and the second downstream address code is to designate a second destination, the second destination that is coupled to receive the stripped signal from the first destination after the signal is stripped of the first downstream address code by the first destination.

9. (Previously Amended) The multiplexing station of claim 8, wherein the temporal address decoder is to strip an optical code from the signal.

10. (Previously Amended) The multiplexing station of claim 9, wherein the optical code is a composite code.

11.-13. (Canceled)

14. (Previously Amended) The multiplexing station of claim 8, wherein the temporal address decoder comprises at least one fiber Bragg grating coupled to strip the code.

15. (Previously Amended) The multiplexing station of claim 14, further comprising an optical circulator coupled to direct the signal to at least one fiber Bragg grating.

16. (Currently Amended) A method, comprising:  
selecting a first temporal code and a second temporal code for an optical signal to identify a first station and a second station of a plurality of second stations, respectively;  
applying the first and second temporal codes to the optical signal with at least one fiber Bragg grating; ~~and~~  
broadcasting the optical signal to a user station via the first station and the second station; and  
stripping the first temporal code from the optical signal at the first station.

17. (Previously Amended) The method of claim 16, wherein the temporal code is a composite code.

18. (Canceled)

19. (Previously Amended) A passive optical network, comprising:  
at least one multiplexing station that receives a first optical signal, applies a first-level code to the first optical signal, and transmits a coded first optical signal; and that receives a second optical signal, decodes a first-level code from the second optical signal, and transmits a resulting decoded optical signal; and  
a second-level multiplexing station that receives an optical signal from the first-level multiplexing station and decodes the optical signal to decode a second-level code.

20. (Original) The passive optical network of claim 19, wherein the second-level multiplexing station applies a second-level code to an optical signal that is transmitted to the first-level multiplexing station.

21. (Original) A communication system, comprising:  
a user station that transmits an optical signal.  
a second-level mux station that receives the optical signal and applies a second-level code to the optical signal, thereby producing an encoded optical signal;

a first-level mux station that receives the encoded optical signal from the second-level mux station and applies a first-level code to the encoded optical signal producing a composite-coded optical signal; and

a central station that receives the composite-coded optical signal and decodes the first-level code and the second-level code to identify the user station that transmitted the optical signal.

22. (Previously Amended) The central station of claim 6, wherein the code to be applied by the encoder is a composite code.

23. (Currently Amended) A central station for an optical network, comprising:  
a decoder to decode a composite code from an optical data signal received from a first station, the composite code having a first-level code and a second-level code, wherein the first-level code is to identify the first station and the second-level code is to identify a second station coupled to provide an output signal to the first station, wherein the output signal is coded with the second-level code and the first-level code is added by the first station to the second-level code of the output signal; and  
an optical receiver coupled to produce an electrical signal from the decoded optical data signal.

24. (Previously Amended) The central station of claim 23, wherein the composite code is a temporal code.

25. (Previously Amended) The central station of claim 23, wherein the electrical data signal contains data from a user station of a plurality of user stations to be provided to an external data link.

26. (Currently Amended) A multiplexing station for a multi level optical network comprising:

an encoder to encode an optical signal to designate the multiplexing station's level, the optical signal containing data from a user station of a plurality of user stations; and

a beam combiner to combine the optical signal with one or more other optical signals.

27. (Previously Amended) The multiplexing station of claim 26, wherein the encoder includes at least one fiber Bragg grating to encode an optical signal.

28. (Previously Added) The multiplexing station of claim 27, further comprising an optical circulator coupled to direct the optical signal to the at least one fiber Bragg grating.